Occupational Health and Safety

Toxicological Index

Toxicological Index

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Data Sheet Users' Guide

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introduction

The purpose of the Toxicological Index is to provide information on industrial and commercial products to help workers protect their health and ensure their safety.

The information is presented under the following headings:

Identification and use of product
Workplace Hazardous Materials Information System (WHMIS)
Transportation of Dangerous Goods (TDG)
Regulations
Product composition
Physicochemical properties
Toxicological properties
Prevention
First Aid

This guide was prepared to facilitate use and understanding of the information provided on Material Safety Data Sheets. For example, by defining the properties of the products and by showing how to use this information for purposes of prevention. The principal terms used in the sections "physicochemical properties" and "toxicological properties" are included in a list of keywords.

identification and use of the product

This section provides the C.A.S. number (1), the name of the product (2), some of its synonyms (3), and its main uses (4).

Example of a product:

1. C.A.S.: 108-88-3 (Number given by the **Chemical Abstracts Service** Division of the **American Chemical Society** for identification of a chemical substance).
2. Name: Toluene
3. Other names: Toluol; Methyl benzene; Phenylmethane; Methylbenzol.
4. Use: Solvent for organic products, explosives manufacturing.

workplace hazardous materials information system (WHMIS)

WHMIS is a Canada-wide system designed, among other things, to facilitate access to information on hazardous substances used in the workplace. With this system, the substances are grouped into six main classes based on the hazards presented by the substances in question.

Classes

A: Compressed gas

B1: Flammable gas
B2: Flammable liquid
B3: Combustible liquid
B4: Flammable solid
B5: Flammable aerosol
B6: Reactive flammable material

C: Oxidizing material

D1A: Very toxic material causing immediate and serious effects
D1B: Toxic material causing immediate and serious effects

D2A: Very toxic material causing other toxic effects
D2B: Toxic material causing other toxic effects

D3: Biohazardous infectious material

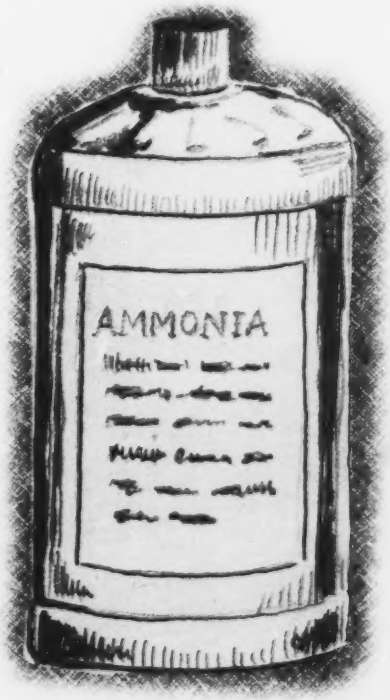
E: Corrosive material

F: Dangerously reactive material

Ingredient Disclosure List

Indicates whether or not a substance is included in the ingredient disclosure list contained in the federal Hazardous Products Act, and at what concentration level its presence must be disclosed (namely 0.1% or 1.0%).

Example:
Ammonia must be revealed as a component if its concentration in the mixture is equal to or greater than 1.0% by weight.



transportation of dangerous goods (TDG)

Indicates what class(es) under the federal Transportation of Dangerous Goods Act a hazardous substance belongs to, and any particular provisions regarding its transport.

Definitions

PIN (UN): Numeric or alphanumeric designation to identify a substance or group of substances with the same characteristics.

Primary Class: Main class to which a substance belongs. This class has priority over subsidiary classes.

Subsidiary Class: Other class(es) to which a substance belongs.

Packing Group: Level of hazard inherent to dangerous goods.

Special Provisions: Special measures with regard to handling, transport requisitions for, or transport of, a given hazardous substance.

IMO Group: Classification according to the International Maritime Organization.

ICAO Group: Classification according to the International Civil Aviation Organization.

regulations

This section indicates the permissible concentration in the air.

Example:

Toluene

Regulation	Average		Maximum	
	ppm	mg/m^3	ppm	mg/m^3
Permissible concentration in the air	100	375	150	560

The *average* permissible concentration in the air is the average limit of daily exposure to a contaminant by a worker per one eight-hour work day weighted for a 40-hour week.

The *maximum* permissible concentration in the air is the maximum limit of exposure by a worker to a contaminant for uninterrupted period, of 15 minutes up to 4 times per work day.

These concentrations are expressed in ppm* and/or in mg/m^3 (milligrams of the product per cubic metre of air).

** ppm is a measure of concentration by volume. Concentration is expressed in parts per million, e.g. 1 cm^3 of the product by million cm^3 of air.*

Example:
1 ppm is the volume occupied by an orange in a carload of goods or 1 cent in 1 million cents.

product composition

This section contains various elements of information on the components of mixtures.

Example:
ABC antifreeze:
- *yellow dyestuff n° 24*
- *ethylene glycol*

List of Components

Reveals controlled products in a mixture. These ingredients are taken from the ingredient disclosure list (see page 8) or belong to at least one of the criteria in one of the WHMIS classes.

Lethal Dose 50 (LD_{50})

Quantity of a substance that causes death in 50% of the population of an animal species under rigorous laboratory conditions.

Example:
1,1,1 - Trichloroethane
LD_{50} rat (oral) = 10,300 mg/kg
LD_{50} mouse (oral) = 11,240 mg/kg

Lethal Concentration 50 (LC_{50})

Concentration of a substance in the air that causes death in 50% of the population of an animal species under rigorous laboratory conditions.

Example:
1,1,1 - Trichloroethane
LC_{50} mouse (inhalation) = 3,911 PPM/2H

Concentration of Components

Concentration is the ratio between the quantity of a component and the total quantity of the mixture. It can be expressed as a percentage and interpreted as the following ratio:

- Weight of component/weight of mixture (W/W)
- Weight of component/volume of mixture (W/V)
- Volume of component/volume of mixture (V/V)

Example:
Ethyl alcohol 95% (V/V)
Acetone 60-100% (W/V)

physicochemical properties

This section describes the physicochemical characteristics of the product based on current scientific knowledge.

For some products, a given piece of information may not be available or a given piece of information may not apply. In these cases, the abbreviation **N.Av.** (not available) or **N.Ap.** (not applicable) are indicated in the space reserved for the characteristic.

Chemical Formula

Only pure substances have a specific chemical formula. The symbols in this formula express the elements of the substance in question.

Example:
Toluene: C_7H_8

Molecular Weight

Indicates the ratio of a molecule's weight compared to a hydrogen atom. This applies only to a pure chemical substance.

Example:
Toluene: 92.15 g

Physical State

Indicates whether the product is in the gaseous, liquid or solid state at room temperature.

Appearance or Characteristics

Specifies the appearance or characteristics of the product.

Example:
If the product is solid, it may be crystalline, granular, powdery, etc. If the product is liquid, it may be thick, jelly-like, heavy, etc.

Colour and Odour

These are physical characteristics of the product.

Example:
White, colourless, gray; and fruity, aromatic, ethereal, etc.

Olfactory Identification Limit

This is the minimum concentration of the substance in the air capable of being detected by the human sense of smell. It is usually expressed in parts per million (ppm).

Example:
Ammonia may be detected at 5 ppm.

Density and Specific Gravity

Density and specific gravity are physicochemical data related to the weight of a specific volume of the product. Density is the weight of a product per unit of volume. It is expressed in grams per millilitre (g/ml) at 20°C. The specific gravity expresses the number of times the product is heavier than water. Should the value of the specific gravity be less than 1 for a given product, the product will float on water. On the other hand, should this value be greater than 1, the product will sink to the bottom. This information is useful in forecasting the behaviour of a product in the event of leakage or accident.

Example:
Toluene has a specific gravity of 0.866. Since this value is less than 1, it will float on water.

Freezing Point

Temperature at which the product changes from the liquid to the solid state at normal atmospheric pressure. For a pure substance, the freezing point is the same as the melting point.

Example:
Water freezes at 0°C.

Melting Point

Temperature at which the product changes from the solid to the liquid state at normal atmospheric pressure.

Example:
Ice melts at 0°C.

Boiling Point

Temperature at which the product changes from the liquid to the gaseous state at normal atmospheric pressure.

Example:
Water boils at 100°C.

Vapour Pressure

When a substance evaporates, its vapours create a pressure in the surrounding area. This pressure is called vapour pressure. It is expressed in millimetres of mercury (mm of Hg). A vapour pressure above 760 mm indicates a substance in the gaseous state. The higher a product's vapour pressure, the more it tends to evaporate.

Example:
Water has a vapour pressure of 17.5 mm of Hg, while ether's is 442 mm of Hg at 20°c. Ether therefore evaporates faster than water.

Vapour Density

This number indicates the number of times that the vapours of a substance are heavier or lighter than air: this measurement is taken at the boiling point.

If the vapour density is greater than 1, the vapours will tend to stay near the floor.

Examples:
Toluene has a vapour density of 3.14. At its boiling point therefore, its vapours have a strong tendency to collect at floor level.

Please Note: The behaviour of vapours applies only for a short period of time and at a temperature close to the boiling point. It is important to note that vapours given off as the product boils disperse in the air with time and that the tendency of vapours to stay at floor level is less as the gap between the ambient temperature and the boiling point widens.

Evaporation Rate

The evaporation rate expresses how many times a substance evaporates more rapidly than another. Speed of evaporation varies according to the nature of the substance and temperature. Generally speaking, organic liquids (e.g. toluene) evaporate more quickly than water.

Example:
The evaporation rate of methyl ethyl ketone is 2.7 times that of ether. Methyl ethyl ketone thus evaporates 2.7 times faster than ether.

Flash Point

The flash point of a liquid is the lowest temperature at which a sufficient amount of vapour is given off to create a mixture with the air which is flammable on contact with an open flame or spark. The flash point is established by one of the two following methods: in a **closed cup**, (inside its container), or in an **open cup**, (near the surface of the liquid). The lower the flash point of a liquid, the higher the risk of fire.

Example:
Normal butanol has a closed cup flash point of 37°C. It is therefore highly flammable on a hot summer day when its vapours come into contact with an open flame or spark.

Auto-ignition Temperature

Lowest temperature at which spontaneous combustion of the substance begins in the absence of any flame or spark. The closer the auto-ignition temperature is to the ambient temperature, the greater risk of fire.

Example:
Turpentine has an auto-ignition temperature of 253°C. It will therefore not ignite by itself at normal room temperatures.

Upper and Lower Flammable or Explosive Limits

Maximum and minimum concentration of vapours of a substance in the air forming a mixture which is flammable or explosive in the presence of an ignition source. It is expressed as a percentage of the volume of vapour in the air.

Example:
Ethylene has a lower explosive limit of 2.7% and an upper limit of 36%. In the presence of a source of ignition therefore, when the concentration of vapours is less than 2.7% or greater than 36%, there is no risk of explosion. But as soon as it reaches any concentration between these two limits, the mixture is in danger of exploding. It is usually best to keep the concentration of the product in the air below its lower explosive limit, by using suitable ventilation for example.

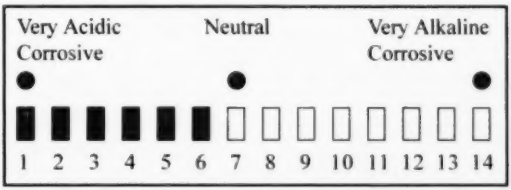
Coefficient of Water/Oil Distribution

This is the ratio of a substance's distribution between oil and water when they are in contact.

A value of less than 1 indicates better solubility of the substance in oils and grease. Such a product is more likely to be absorbed by the skin. A value greater than 1 indicates a better solubility in water. This product could therefore be absorbed by the mucus lined areas of the body, such as the nasal passages or the lungs. This information can be useful in assessing first aid requirements, and can help in the selection of proper protective equipment.

pH

pH is expressed by a numerical value indicating whether a solution is acidic or basic. Water is neutral with a pH of 7. Acids (e.g. vinegar) have a pH lower than 7. The lower the value, the stronger the acid. Bases (e.g. caustic soda in solution) have a pH higher than 7. The higher the value, the stronger the base.



Solubility in Water at Saturation

Maximum quantity of the product that can be dissolved in water. This is usually expressed in grams per litre.

Granulometry

This characteristic expressed in microns* indicates the size of particles in a powder. Particles of less than 10 microns are capable of deep penetration and deposition in the lungs. Slightly larger particles will deposit in the upper lungs and throat, and although they are generally removed, they can still dissolve and be absorbed by the body.

Knowledge of particle sizes is used to select proper respirator types and other controls (e.g. ventilation).

**A micron is 1/1000 of a millimetre. For example, one micron is about 1,000 times smaller than a grain of sand.*

Stability

This indicates whether or not the product is stable, and, if necessary, the conditions which make it unstable.

Example:
When strongly heated, hydrazine chlorhydrate gives off toxic products (hydrogen chloride and hydrazine).

Incompatibility

This indicates whether or not a product can be placed in contact with certain specified substances.

Example:
Sodium hypochlorite (bleach) is incompatible with strong acids. On contact with strong acids, it releases highly toxic chlorine vapours.

Reactivity

This indicates whether a product is likely to react violently or dangerously under normal conditions of use.

Example:
Perchloric acid can explode on impact or with friction.

Polymerization

This indicates whether the product can change into a polymer (union of several molecules) and under what conditions this change takes place. The heat given off or the expansion in volume or both, caused by the polymerization reaction could cause the container to break and the residual product (unpolymerized) to be spilled. Control of conditions for polymerization helps avoid such accidents.

Example:
Exposure to light or contact with strong bases can cause acrolein to polymerize.

Decomposition Products

Lists the substances likely to form when a given product decomposes. The decomposition can result from a reaction which occurs at room temperature, from exposure to light, or from the effect of heat on the product, etc.

Example:
Sodium cyanide decomposes in humid air, releasing hydrogen cyanide (a toxic gas).

toxicological properties

This section provides the toxicological characteristics of a given product based on current scientific knowledge.

Routes of Absorption

All natural routes by which a contaminant can penetrate into the organism and produce harmful effects: respiratory tract (by inhalation), digestive tract (by ingestion), skin (by absorption).

Example:
Carbaryl (insecticide): respiratory tract, digestive tract, skin.

Exposure by Contact

Any part of the body on which a contaminant can have a toxic effect on contact.

Example:
Nitric acid: skin, eyes.

Toxic Effects

Toxic effects can be classified by duration of exposure: acute effects and chronic effects.

A - Acute Effects

A change experienced by the body within a relatively short period of time (minutes, hours, day) following exposure to a contaminant.

Example:
Acetone: irritation of the eyes, skin (eczema) and respiratory tract; depression of the central nervous system: headache, nausea, vomiting, loss of coordination, dizziness, mental confusion, weakness, narcosis.

B - Chronic Effects

A change experienced by the body over a relatively long period of time (weeks, months, years) following repeated exposure to a contaminant.

Example:
Methanol (wood alcohol): dermatosis, blindness, liver damage.

Please Note: In the description of acute or chronic toxic effects, the user will occasionally encounter the expression "by analogy", "with reference to toxicity of..." and "by estimate". These are indirect assessments of toxicological properties. These assessments are sometimes necessary due to lack of available information on the product.

Some products can dissolve in water (e.g. soluble salts). Their toxicological properties can be deduced from one of the parts thus obtained. They are then said to have been assessed by analogy to toxicity of this part.

Example:
The acute effects of cadmium fluoride may be assessed by analogy to cadmium chloride.

For other products, toxicological properties can be assessed but with less certainty than those just mentioned. In this event, they would be similar to the toxic effects other products of the same type have in common. "With reference to toxicity" of this classification of product is then used.

Example:
The acute and chronic effects of silver chloride have been assessed by reference to toxicity of inorganic salts of silver.

Toxicity of products containing several components, as is the case with many commercial products, is estimated by taking account of the physicochemical and toxicological properties of all the components, together with the relative quantity of each. The toxicological properties of a product are then said to have been evaluated **by estimation**.

Example:
Ethylene diamine in 50% aqueous solution is a compound product, the toxicity of which has been assessed by estimation.

Teratogenic Effect

Indicates that the product can cause a birth defect.
Teratogenic contaminants can be qualified as being:

Proven: When this effect has been shown in humans.
Possible: When this effect has been shown in animals or suspected in humans.
Suspected: When this effect is suspected in animals.

Example:
Dimethyl mercury is a proven teratogen.

Workers must be made aware of the dangers associated with being exposed to teratogenic contaminants to allow determinations concerning any potential risks to be reached.

Mutagenic Effect

Indicates that the product can cause changes to the genes (heredity-carrying material). The mutagenic contaminant can be qualified as being:

Proven: When this effect has been shown in humans.
Possible: When this effect has been shown in animals or suspected in humans.
Suspected: When this effect is suspected in animals.

Example:
5-fluoro uracil, an anti-cancer drug, has been proven mutagenic.

Depending on the type of cells affected (eggs or sperm), the descendants of workers of either sex can be affected.

Carcinogenic Effect

Indicates that the product can cause cancer. Carcinogenic contaminants can be qualified as being:

Proven: When this effect has been shown in humans.
Possible: When this effect has been shown in animals or suspected in humans.
Suspected: When this effect is suspected in animals.

Example.
Benzo(a)pyrene, released by combustion of oil is a proven carcinogen.

Information on Teratogenic, Mutagenic and Carcinogenic Effects

Contains complementary data on teratogenic, mutagenic and carcinogenic effects.

Other Effects

Specific effects not described in any of the preceding sections.

Examples:
Radioactive.
Crosses the placental barrier.
Testicular damage.
Embryotoxic and/or foetotoxic.

Interaction

Changes in the toxic effects of one contaminant by another. The effects can be amplified or reduced (synergy or antagonism).

Example:
Methyl ethyl ketone amplifies the neurotoxic effects of methyl butyl ketone and hexane, as well as the toxic effects on the liver.

prevention

This section contains information for the protection of the health and physical condition of workers exposed to the product in either accidental conditions or in conditions of normal use.

Flammability

Indicates whether or not there is a danger of the product catching fire and under what conditions.

Example:
Toluene is flammable when strongly heated or close to a source of ignition.

Please Note: When a product is classified as flammable, measures must be taken to prevent it from reaching its temperature of auto-ignition or flash point as the case may be.

Explosivity

Indicates whether there is a danger of explosion when the product is used (see upper and lower flammable or explosive limits).

Fire or Explosion

Indicates the products to be used or the measures to be taken to fight a fire or an explosion involving the product, together with possible combustion products and special procedures for controlling the consequences of a fire or explosion.

Example:
Toluene:
Extinguishing agents: *Carbon dioxide, dry chemicals.*
Special procedures: *Wear a self-contained breathing apparatus.*
Combustion products: *Carbon monoxide, carbon dioxide.*

Leaks or Accidents

Indicates the measures to be taken in the event of a leak or accident involving the product, together with methods of disposal under these circumstances.

Example:
Toluene:

Measures: *Absorb with paper, sand or sawdust. Place in a tightly-sealed container.*

Waste disposal: *Contact the regional office of the Department of Environment and Labour.*

Protective Equipment

Indicates the parts of the body to be protected and the type of protective equipment needed when using the product.

Handling

Indicates how to handle the product safely.

Example:
Trimethylaluminum: never pour water onto this product. Handle in a dry, inert atmosphere.

Storage

Indicates conditions for safe storage of the product.

Example:
Toluene: Store in a tightly-sealed container in a well-ventilated area. Keep away from sources of heat and ignition. Keep away from oxidizing substances.

first aid

This section indicates the first aid to be administered in the event of an intoxication or accidental contact with the product.

Example:
Xylene:

- *Flush eyes with copious amounts of water and see a physician.*
- *Quickly remove contaminated clothing. Wash skin with soap and water.*
- *If ingested, do not induce vomiting. Call a physician.*
- *If incapacitated by vapours remove to a well-ventilated area. If breathing has stopped administer artificial respiration. Call a physician.*

List of Keywords

The following is a list of words you may find when reading material safety data sheets.

A

Acro-osteolysis Progressive destruction of bone tissue at the tip of the fingers and toes.

Albuminuria Presence of albumin in urine.

Alkalis Certain hydroxides of metals (e.g.: sodium hydroxide, potassium hydroxide, etc.). Alkalis are bases.

Alopecia Usually temporary total or partial loss of scalp or body hair.

Amensia Total or partial loss of memory.

Anemia Reduced red blood cell count or reduction in the amount of hemoglobin per unit volume of blood.

Anhydrous Milieu not containing water, opposite to humid; or substance which does not contain water, as opposed to hydrated.

Anorexia Loss or reduction of appetite.

Anoxia Reduction in the quantity of oxygen delivered to the tissues by blood.

Anuria Absence of urine in the bladder.

Apathy Reduced emotions with lack of interest in exterior stimuli.

Apnea Prolonged respiratory arrest.

Arythmia Disturbed heartbeat.

Asphyxia Difficulty in breathing or respiratory arrest.

Asthenia Reduced physical and psychological strength.

Asthma Respiratory syndrome characterized by dispnea attacks.

Ataxia Loss of coordination of voluntary movement.

Atrophy Loss of weight and volume of an organ, tissue or cells.

B

Bradycardia Decreased heartbeat rate.

Bronchitis Inflamnation of the bronchia.

Bronchoconstriction Contraction with narrowing of bronchia.

Bronchospasm Spasmodic contraction of the muscles surrounding the bronchia.

Byssinosis Affliction of the lung due to chronic inhalation of cotton dust.

C

Cathartic Substance which stimulates evacuation of the intestines.

Cephalea Headache.

Chloracne Acne-like affliction of the skin from exposure to certain chlorinated products.

Chlorhydrate Chemical substance combined with hydrogen chloride in a very specific proportion (e.g.: hydroxylamine chlorhydrates).

Cirrohsis Chronic progressive illness affecting the structure and function of the liver.

Co-carcinogen Substance capable of enhancing the carcinogenic effect of another substance simultaneous exposure).

Collapsus Rapid decrease in strength or collapse of an organ.

Congestion Abnormal accumulation of blood vessels in tissue, an organ or part of the body.

Conjunctivitis Inflammation of the conjunctiva (part of the eye).

Convulsions Violent involuntary muscle contractions.

Corrosion Destruction of biological tissue or of materials by a contaminant (chemical action).

Cutaneous Relating to the skin.

Cyanosis Bluish coloration of the skin and mucosa, resulting from blood oxygenation disorders (abnormal presence of hemoglobin).

D

Degenerescence Abnormal transformation of an organ, tissue or a faculty leading to change in its functioning, not always permanent.

Deliquescent Substance which absorbs moisture from air to the point of becoming liquid.

Dermatitis Inflammation of the skin.

Dermatosis Generic name for all skin disorders.

Desquamation Abnormal elimination of surface layers of skin in small flakes.

Diuresis Formation and excretion of urine.

Diuretic A substance which increases the volume of urine.

Dysarthria Difficulty in articulating words.

Dysmetria Coordination disorder characterized by loss of ability to judge degree of muscle movement.

Dysphagia Difficulty in swallowing.

Dysphonia Change in voice.

Dyspnea Difficulty in breathing.

Dysuria Difficulty in urinating.

E

Embryotoxic Toxic effect on the embryo.

Emphysema (pulmonary) Illness characterized by dilation or destruction of the lung tissue.

Encephalopathy Generic name given to illnesses affecting the brain in general.

Epigastric Refers to the area located between the ribs and the sternum above, the flanks on each side and the umbilic region below.

Erosion of the teeth Superficial lesion of the teeth.

Erythema Flushing of the skin (due to dilation of the capillaries).

Euphoria Intense feeling of well-being.

Expectoration Expulsion from the mouth of secretions from the respiratory tract (spit).

F

Fasciculation Isolated, involuntary and anarchic contraction of a group of muscle fibers (not leading to movement).

Fibrillation (ventricular) Rapid and uncoordinated contractions of the muscle fibers of the heart in the area of the ventricles, capable of causing cardiac arrest.

Fibrosis (pulmonary) Chronic lung affliction causing progressive respiratory insufficiency.

Flatulence Accumulation of gas in the digestive tract.

Fluorosis Characteristic chronic intoxication caused by fluorine and its derivatives.

Foetotoxic A substance which is toxic to the foetus.

G

Gastro-enteritis Simultaneous inflammation of the stomach muscosa and intestine.

Gene Heredity-carrying material.

Gingivitis Inflammation of the gums.

Glycosuria Abnormal presence of glucose in the urine.

Granulomatosis (pulmonary) Pulmonary lesion characterized by the formation of small nodules.

Ground Connecting an assembly of conductive parts to the ground in order to control static electricity.

H

Hematemesis Vomiting of blood.

Hemotoma Localized accumulation of blood in tissue.

Hematopoietic System System responsible for formation of blood cells (includes bone marrow and lymphatic organs).

Hematura Presence of blood in the urine.

Hemolysis Destruction of red blood cells, releasing hemoglobin.

Hemorrhage Loss of blood.

Hepatomegalia Increase in liver volume.

Hepatotoxic A substance which is toxic to the liver.

Hydrate Chemical substance combined with water in a very specific proportion (e.g.: calcium sulphate dihydrate).

Hydrolysis Chemical change to a substance in a water environment, leading to the formation of new products.

Hygroscopic Substance with a tendency to absorb moisture from the air.

Hyperhemia See definition of congestion.

Hyperkeratosis Increased thickness of the corneous layer of the skin (corn).

Hyperpigmentation Excessive pigmentation of the skin.

Hyperplasia Abnormal growth of normal tissue.

Hyperreflexia Excessive reflexes.

Hypertension Increased blood pressure.

Hypotension Decreased blood pressure.

Hypothermia Lowering of body temperature to below normal (37°C).

I

Icterus Yellow coloration of the skin and mucosa (jaundice).

IDLH (Immediately dangerous to life and health) Maximum concentration of a substance in air in which an individual can remain unharmed over a period of 30 minutes without having any symptoms preventing them from escaping and without having irreversible effects on their health. This concentration has been defined with the purpose of selecting an appropriate protective breathing apparatus.

Immuno-suppression Decrease in the immune response (defensive mechanism of the organism).

Insoluble Products which cannot be dissolved in each other.

Irritability Tendency to anger.

Irritation Reversible changes of the skin, eyes or mucosa (e.g. redness, inflammation).

K

Keratitis Inflammation of the cornea (part of the eye).

Keratoconjunctivitis Inflammation of the cornea and the conjunctiva of the eye.

L

Laryngitis Inflammation of the larynx.

Lethargy Deep and prolonged sleep (extreme indifference).

Leucopenia Reduced white blood cell count.

Lymphocytosis Increased lymphocyte count (type of white blood cells).

M

Manganism Chronic in intoxication caused by manganese and its derivatives.

Metals (reactive or active) Metals reacting easily and quickly with water, acids, or alkalis (e.g.: sodium, aluminum and zinc).

Methemoglobin Hemoglobin in which ferrous iron has been oxidized into ferric iron, making it unsuitable for carrying oxygen.

Methemoglobinemia Presence of abnormal concentrations of methemoglobin in the blood, resulting in cyanosis.

Micturition To urinate.

Miscible Products capable of mixing completely with each other.

Mucous membranes Membranes lining body cavities and covered by a viscous substance (mucous).

Mydriasis Abnormal dilation of the pupils (part of the eye).

Myosis Reduction in diameter of pupils (part of the eye).

N

Narcosis Artificially-induced sleep.

Necrosis Cellular death, tissue death.

Nephritis Inflammation of the kidneys.

Nephropathy Any affliction of the kidneys.

Nephrotoxic Toxic to the kidneys.

Neurasthenia Psychiatric affliction which is part of the group of neuroses and characterized by asthenia.

Neuritis Inflammation of a nerve.

Neuropathy Any affliction of the nervous system.

Neuropathy (peripheral) Affliction of the peripheral nerves.

Neurotoxic Toxic to the nervous system.

Nystagmus Involuntary oscillating or rotating movements of the eyeballs.

O

Ochronosis Affliction characterized by gray-brown to black coloration of the cartilage, tendons and some areas of the skin.

Oedema or (edema) Diffuse swelling caused by infiltration of liquid into the tissues.

Oliguria Reduction in quantity of urine eliminated.

P

Palpitation Perception of one's own heart beat.

Paresis Incomplete or mild paralysis.

Paresthesia Anomalies in perception of sensation or spontaneous non-painful subjective feeling.

Peritonitis Inflammation of the peritoneum (membrane lining the abdominal cavity and the organs contained within it).

Petechiae Sub-cutaneous hemorrhage characterized by small red spots.

Pharyngitis Inflammation of the pharynx (throat).

Photophobia Unpleasant to painful feeling in the eyes, caused by light.

Photosensitive Substance which changes in the presence of light.

Photosensitization Abnormal reaction (sensitization) of the skin to sunlight.

Pneumoconiosis Chronic affliction of the lungs due to inhaling certain types of dust.

Pneumonia Acute infection of the lung characterized by inflammation.

Pneumonitis (chemical) Inflammation of the lung.

Pneumopathy Any pulmonary affliction.

Polycythemia Abnormal increase in red blood count.

Polyneuritis Inflammation of several nerves.

Polyuria Excretion of an abnormally large amount of urine over a given period.

Pro-carcinogen Product which must be changed by an organism in order to become a carcinogen.

Promoter (of carcinogenesis) Substance capable of enhancing the carcinogenic effects of another substance (subsequent exposure).

Prostration Extreme exhaustion.

Proteinuria Presence of an abnormally large amount of protein in the urine.

Psychosis A group of mental illnesses characterized by a change in personality and loss of contact with reality.

Pyrophoric Substance which ignites spontaneously in air.

R

Radiomimetic Having an action identical to that of radiation.

Rhinitis Inflammation of mucosa of the nasal passages.

S

Saturnism Lead poisoning.

Sensitization Defense reaction by the organism following exposure to a contaminant, resulting in an allergy.

Silicosis Pneumoconiosis caused by inhaling crystalline silica.

Splenomegalia Increased volume of the spleen.

Stenosis Shrinkage of a natural duct or orifice.

Stomatitis Inflammation of the buccal mucosa.

Strabism Inability of the two visual axes to converge on a fixed point (causing cross - eyes).

Sublimate To go directly from the solid to the gaseous state without passing through the liquid state.

Syncope Sudden and complete loss of consciousness following cardiac and respiratory arrest.

T

Tachycardia Increased speed of heart beat.

Tachypnea Abnormally rapid breathing.

Tearing Involuntary flow of tears.

Tetanic Refers to persistence in a muscle contraction.

Thrombocytopenia Reduced blood platelet count.

Tracheobronchitis Simultaneous inflammation of the trachea and bronchia.

Tumorigenic That which causes tumors.

U

Ulceration Creation of an ulcer.

V

Vascular Constriction Contraction of the blood vessels.

Vascular Dilation Dilation of the blood vessels.

Vesication Formation of vesicles on the skin.

units of measure

°C	degrees Celsius
kg	kilogram
g	gram
kPa	kilopascal
l	litre
m	metre
m^3	cubic metre
mg	milligram
ml	milliltre
mm Hg	millimetres of mercury
Pa	pascal
ppm	parts per million
cm^3	cubic centimetre
cm	centimetre
%	percent

Environment and Labour